BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C.

In the Matter of Federal-State Joint Board on Universal Service	))	CC Docket No. 96-45

INITIAL COMMENTS OF THE MISSOURI PUBLIC SERVICE COMMISSION ON UNIVERSAL SERVICE

In a Public Notice released January 5, 1998, the Federal Communications Commission ("the FCC") sought comments in CC Docket No. 96-45 regarding universal service.[1] The deadline originally required Initial Comments by January 20, 1998. That deadline was subsequently moved to January 26, 1998. The Missouri Public Service Commission ("Missouri Commission") provides these Initial Comments relating to the issue of eligibility to receive specific Federal universal service support. Specifically, the Missouri Commission has concerns about the ineligibility of an interexchange telecomunications company who is providing telecommunications services to health care providers to receive reimbursements from universal support mechanisms. The Missouri Commission submits the following comments in support of its position.

Missouri's Telemedicine Network (MTN) has provided an exceptional link between urban and rural areas in the state.[2] MTN is currently configured using T-1 lines connecting 18 rural health care providers to those located in urban areas. Currently, an interexchange carrier (IXC) provides the services between sites and has proven to be an economical choice. Under current universal

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[1] Common Carrier Bureau Seeks Comment for Report to Congress on Universal Service Under the Telecommunications Act of 1996, DA 98-2.

[2] Attachment A is a Report to the Missouri Public Service Commission from the Telemedicine Task Force dated September 22, 1997, which describes the Missouri Telemedicine Network.

service guidelines, a telecommunications provider, such as an IXC, that does not provide "essential services" as determined by the Joint Board would not qualify for universal service support. However, health care services, if they are telecommunications services, should receive universal service support, regardless of the entity providing them.

First, if Missouri had to limit its bids to provide health care services to carriers eligible to receive universal service support, Missouri would be left without options and would be captive to one carrier at the present time. In rural areas of the state, only one telecommunications carrier would be eligible for universal service support and, as such, the bidding process would not accomplish the purpose for which it was meant -- to find the carrier who can provide health care services at the lowest possible cost with the maximum amount of service options.

Second, the health care services network for services such as Telemedicine is more reliable when service is provided by a single entity through end-to-end service rather than multiple carriers providing baseline service with long-distance connections. A network problem can be remedied with a single phone call instead of multiple calls to different carriers to identify the exact location and cause of the network problem. This is crucial when emergency medical consultations are at risk (i.e., Telemedicine).

Third, section 254(h)(1)(B)(ii) of the Telecommunications Act allows telecommunications carriers who may not qualify as "eligible telecommunications carriers" to receive reimbursement from universal service support mechanisms if they are providing service to schools and libraries. Allowing such an exception is very logical because the services that schools and libraries receive from telecommunications carriers are not necessarily linked to the services that the Joint Board has found to be essential services. Essential services are those services in a broad category of what is

necessary for a residential customer to access basic telephone service and emergency medical care. The same logic that recognizes that essential services are often disjointed from schools' and libraries' telecommunications needs would also apply to health care providers' needs. The services that telecommunications carriers provide health care providers are often dissimilar to the essential services named by the Joint Board. An exception to eligible telecommunications carrier status should also be available for those carriers providing telecommunications services to health care providers.

The Missouri Commission urges that otherwise ineligible telecommunications companies who are providing telecommunications services to health care organizations be permitted to receive reimbursement from universal support mechanisms by expanding the exception set out for those serving schools and libraries. This is crucial because interexchange (rural to urban) connections for health care services are often most successfully provided by IXCs and would permit more entities an opportunity to offer affordable options. Additionally, the services that health care providers receive from telecommunications carriers are often more similar to services received by schools and

libraries involved in distance learning rather than essential services provided to residential customers.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing document have been served by first class United States mail, postage prepaid, to the persons listed below on this 26th day of January, 1998.

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REPORT TO THE

MISSOURI PUBLIC SERVICE COMMISSION

FROM THE

TELEMEDICINE TASK FORCE

Case No. TO-94-380

SEPTEMBER 22, 1997

Contents

Executive Overview

The Missouri Telemedicine Task Force presents this report in an effort to educate the reader about the activities of the Missouri Telemedicine Network (MTN). For the novice readers' convenience in gaining general information about Telemedicine, this report includes an article entitled, "Understanding Telemedicine: Ten Basic Concepts," and MTN Questions and Answers, both of which provide an excellent introduction to Telemedicine. These documents can be found in Attachment A.

This report contains details about MTN's activities followed by discussion of transmission charges paid by the MTN and concludes with an evaluation of the MTN as of September 1997.

I. Activities

A. Equipment Purchased and/or Installed Since October 1, 1996

1. VTEL video conferencing units were purchased for Moberly Regional Medical Center (MRMC) and the University Physicians Medical Building (two units) on the University of Missouri Health Sciences Center (MUHSC) Campus. The MRMC unit was purchased by Southwestern Bell Telephone (SWB) and the University Physician's units were purchased by the University of Missouri Health Sciences Center (MUHSC).
2. MRMC and the University of Missouri (MU) purchased Canon Vizcam cameras for dermatology and other specialties needing to look at skin-related conditions or wounds.
3. Elmo document cameras were purchased by SWB for MRMC and by MU for University Physicians.
4. A Cisco network router was purchased by University Physicians (UP) for data connections to the University Physicians Clinic which is attached to MRMC These routers provide access to the UP scheduling and billing system, e-mail access, connections to the Internet, and connections to the Medical Libraries at MU.

B. Uses of the Missouri Telemedicine Network

1. Consultations Between October 1, 1996 and May 31, 1997

SPECIALTY	AD HOC (# OF CASES)	CLINIC (# OF CASES)	TOTAL CASES
Cardiology	1	0	1
Dermatology	6	13	19
Nephrology	2	0	2
Neurology	1	0	1
Phys. Med & Rehab.	1	0	1
Psychiatry	2	95	97
Surgery - ENT	1	0	1
TOTALS:	13	108	122

In addition to the above consultations, the MTN Teleradiology connections provided 1365 radiology cases between October 1, 1996 and May 31, 1997. Most of these cases involved the transmission of multiple films. Attachment B includes graphs showing use of the MTN for Clinical Encounters and Radiology Transmissions.

2. Type of Practitioners Using the Telemedicine Systems

Family Practitioners
Dermatologists
Psychiatrists
Psychologists
Neurologists
Surgeons (ENT, Neurosurgery, General, Vascular)
Cardiologists
Pediatric Cardiologists
Geriatric Psychiatrists
Radiologists
Child Health/Neonatologists
Emergency Medicine
Internal Medicine
Radiology Techs
Emergency Room Nursing Staff
Flight Nurses

Patient Educators

3. Other Non-Clinical Uses of the Telemedicine Systems from October 1, 1996 to May 31, 1997

NETWORK USE	NUMBER OF EVENTS
Continuing Medical Education	216
Accredited Classes	68
Telemedicine Training	12
Other Education	15
Administrative Meetings	114
Telemedicine Demonstrations	18
Telemedicine System Tests	14
Other Meetings	3
Total Non-Clinical Network Use	460

Attachment C includes graphs showing the use of the MTN for educational programs and video meetings.

4. Estimated Percent of Time Used from October 1, 1996 through May 31, 1997
(based on total hours of usage)

	10/01/96 - 01/31/97	**02/01/97 - 05/31/97**
Educational Programs	66.4 %	62.0 %
Meetings	25.7 %	16.8 %
Clinical	7.9 %	21.2 %

C. MTN Evaluation Activities

1. MTN Data System

The basis for MTN's evaluation activities is the MTN data system. MTN data forms are completed every time the network is used for clinical, educational or administrative purposes. The MTN staff tracks MTN activities to assure that data are collected, and enters the data into the project's data management system, which is implemented in Visual FoxPro 5.0. Data are backed up and archived at

two off-site locations daily. Attachment D includes the forms currently in use. In order to protect patient privacy, no names or other individually identifiable items are included in the project's computerized databases. The system provides information of the following kinds:

Basic utilization data - who, what, when, and where. Includes types of providers, diagnoses, types of care provided (consultations, direct care, etc.), types of educational programs and meetings, etc.

Impact of telemedicine on the process of patient care - e.g., how would the situation have been handled without telemedicine, what was the result of the encounter in terms of diagnosis and treatment, etc.

Patient disposition - was the patient referred to a specialist, admitted to a hospital, etc., as a result of the telemedicine encounter. This will be useful in studies of patient retention by rural providers, impact of telemedicine on health care utilization, etc.

Patient and provider satisfaction.

Patient time and travel saved by telemedicine.

Provider time and travel saved by telemedicine.

2. Emergency Room (ER) Transfer Study

Reports from earlier telemedicine projects suggest that when rural hospitals are connected to tertiary care emergency rooms by telemedicine, the rural facilities can safely keep many of the patients who would have formerly been transferred. If true, this would have an especially significant impact on the future viability of rural hospitals and would represent significant savings, since the cost of transfers would be avoided and tertiary hospitalizations are usually more expensive than comparable hospitalizations in community hospitals. In order to test this hypothesis, MTN is conducting a study involving four of its rural hospitals with ERs. Data have been collected since 1995 on ER transfers to establish baseline patterns. Data collection will continue through the end of the current RTGP program and, it is hoped, for an additional three years in order to track the impact of telemedicine.

The following figures show the number of transfers from participating ERs that have occurred during the study period to date. A complete data record has been collected on every transfer:

1994-1996

Boonville: 980 transfers
Fulton: 559 transfers
Brookfield: 673 transfers
Macon: need 1996 data to calculate

3. Cost Study

Two health economists from the University of Missouri-Columbia's Health Services Management Program have initiated a study intended to develop an accurate cost model for MTN. No cost-effectiveness or cost-benefit analysis can be reliable without an accurate cost model as a base, and telemedicine is complicated enough that all its costs are not obvious. A preliminary version of the model has been developed and a staff time study will soon be implemented to provide important missing information. [Please note the staff time study could not be conducted until MTN reached the stage of being integrated into everyday clinical activities. The model is meant to reflect the cost of ongoing telemedicine services, rather than the startup phases of a telemedicine project.] When it is more complete, the model will provide information on broad categories of cost such as personnel and telecommunications and will define the costs of individual telemedicine encounters and other activities.

4. Groundwork for Future Studies

Some of the studies planned by MTN require data from ongoing clinical utilization, which of course has not yet occurred in sufficient quantity. MTN has, however, laid the groundwork for several studies of this kind.

Cardiology Outreach Study - MUHSC has an active cardiology outreach program that is currently sending cardiologists to outreach clinics at several rural sites, some of which are MTN communities. Cardiology at the MUHSC is an especially well managed service with good administrative records. This situation presents a good opportunity for a case study of the impact of telemedicine in an active rural outreach program. Several discussions have been held with cardiology administrators and attending physicians, and the implementation of the first telemedicine cardiology outreach activities is expected in June, 1997.

Clinical Utility Studies - Since its beginnings, the MTN has been interested in studies of the clinical use of telemedicine compared with in-person care. Studies of this kind will become possible as utilization increases.

Telemedicine and Health Care Utilization Patterns - The MTN Data System provides information on the retention of telemedicine patients and on the impact of telemedicine on the process of patient care. Comparative studies are planned using non-telemedicine patients at MTN sites, and non-MTN sites, in order to compare telemedicine patients to other similar cases.

Provider Burnout - One factor affecting the retention of rural providers is the sense of professional isolation they experience, which contributes to provider burnout. Telemedicine helps reduce that sense of isolation. The project will be conducting a baseline survey on rural provider burnout, using an instrument previously validated in other studies, during the

coming summer. Providers in telemedicine and nontelemedicine rural communities will be included. The MTN Staff hopes that it will be possible to conduct follow up studies using the same instrument during the next three years in order to track the possible impact of telemedicine on provider burnout.

D. Activities Undertaken to Market and Disseminate Information about the MTN

1. Director of Telemedicine

Joe Tracy, Director of Telemedicine is being placed on a speakers list for community service groups (e.g., Rotary) located in MTN sites. He also attends affiliate meetings with each site on a monthly basis. These meetings involve telemedicine along with other outreach activities and issues relating to the MUHSC and the rural site. These meetings typically include hospital administrators, physicians, and hospital board members who are typically business leaders in their community.

2. Newsletters/Periodicals:

The MTN Clinical Bulletin - (see Attachment E for the June, 1997 issue) is a newsletter that deals with telemedicine issues of interest to clinicians in the MTN sites. It is distributed to the clinicians, administrators and other clinicians at each MTN site. The purpose of this newsletter is to give the clinicians current information on clinical services, education programs and other MTN activities of interest.

The MTN was featured in the Missouri Medical Review in the Winter 1997 issue. A copy of that article is provided in Attachment F. This periodical is distributed State wide to physicians, hospitals, clinics and other clinicians in Missouri.

MTN educational services and programs were featured in UPDATE - News From University Physicians. A copy of that article is provided in Attachment G. This periodical is distributed State wide to physicians in Missouri.

The MTN Network Development Status Report contains a brief look at what is going on with each MTN site and other sites wanting to become part of the network. This report is distributed specifically to those involved in MUHSC outreach activities and to HRSA. The most recent report can be found in Attachment H.

3. Web Site

The MTN WWW site can be found at "http://www.MUHSC.missouri.edu/telemed/". It provides a history of tele-

medicine at MU, information on the MTN sites, equipment listings, lessons learned, and the MTN Clinical Bulletin.

E. Training Activities at the Hub and Spoke Sites

1. Hub Site Training

Individuals whom the MTN staff feel may be interested in or may benefit from telemedicine are invited to a demo/training program. The MTN staff has found no better way to gain acceptance than to allow individuals to personally use the equipment and provide feedback as to how they would like to use the equipment for their benefit.

Additionally, the MTN staff is now receiving unsolicited calls from clinicians who want to get involved in the project. The staff quickly schedules these individuals and their staff for training sessions.

2. Rural Site Training

Training at rural sites is an ongoing activity for the MTN staff. Within the next three months a refresher training course will be conducted at each site or over the network.

Each site has a site coordinator who is responsible for training the staff at his or her respective facility. The MUHSC has requested that a minimum of three people on each shift be trained in the use of the equipment. This ensures that someone very familiar with the equipment is available to handle a consultation 24 hours per day.

3. Protocols and Troubleshooting Material

Each site has the following protocol sheets attached to their systems:

- Important Telemedicine Phone Numbers
- How to Request Connections to any MTN Site
- How to Schedule Outpatient/Non-Urgent Consultations
- How to Make Telemedicine Connections
- How to Connect to University Hospital for ER Consultations
- How to Shut Down the Systems
- How to Physically Move and Reconnect the Systems

Each site will be receiving a detailed trouble shooting manual in June 1997. This manual includes:

- Lists of all MTN Contacts
- A copy of the VTEL Tablet Template
- The most current monthly University Hospital ER Physician Schedule
- The most current monthly Telemedicine "on call" schedule
- A complete copy of the protocols listed above

T1 Circuit Listing by Phone Company
MCU Settings and Troubleshooting
Settings for Proprietary and Standards Based Conferences
List of all CODEC serial numbers
Detailed instructions for using and troubleshooting:
- Electronic Stethoscope System
- Video Scope System
- Elmo Document Camera
- Canon Viscam Camera (dermatology)
- VCRs

Troubleshooting the most common IATV problems associated with:
- Boot-up
- No Far End Connection
- Audio
- No Local Video
- No Far Site Video
- Site Profile Database

4. Scheduling Telemedicine Consultations

Telemedicine consultation scheduling at the MUHSC is changing in a significant fashion. That is, with the help of University Physician information systems, reimbursement, and billing staff, telemedicine appointments are being scheduled in the same manner as in-person appointments. This new scheduling process is being tested in the University Physician's Boonville Clinic through the month of June. It will then be deployed to the other MTN sites.

This scheduling and billing system is important for several reasons:

a. By incorporating telemedicine into the existing scheduling and billing systems the MUHSC is demonstrating its commitment to the program.

b. It allows scheduling to be done with one call and participants can schedule the rooms and staff at both ends of the consultation along with the network time.

c. Encounter forms are generated for the encounter when the patient "arrives" on the IATV System.

d. Billing and clinical information is entered into the existing systems from which statistics can be generated easily for every telemedicine site. Of course, other pertinent information is also captured via the MTN evaluation forms and entered into the MTN data system.

e. If the patient has an existing medical record at the MUHSC, that record will automatically be delivered to the specialty clinic as if the patient were going to be seen in-person. Otherwise, the patient is assigned a medical record number as a new patient to the MUHSC.

There are two forms of this new type of scheduling. One is for the rural sites to schedule into the clinics at the MUHSC. The other allows the University physicians to schedule their patients into a "follow-up" block of time being provided by each site. Each specialty clinic will know the follow-up block of time allocated at each site and will ask patients on discharge if they would like to be followed via telemedicine.

As with any change the full implementation of the new scheduling system will take time. As such, the MTN staff continue to handle a number of appointments for ad hoc and scheduled consultations. The MTN staff is confident that all appointment will be scheduled via the University Physicians IDX scheduling and billing system by the end of the summer.

Emergency medicine and trauma support is provided by the MTN 24 hours a day. As such, personnel in the emergency room have received training not only in the use of the various pieces of equipment, but have also been taught how to access the software that controls the T1 lines so they can connect any two locations on the network.

F. Reimbursement Activities

In the fall of 1996, a letter was sent to most private insurers in Missouri indicating that the MUHSC would begin billing for telemedicine consultations on January 1, 1997. These letters were followed up with phone calls to each insurance company. The results as of May 31, 1997 indicate that 21 private insurance companies will reimburse for telemedicine consultations, three of which will reimburse on a case by case basis. Attachment I provides a listing of the latest reimbursement update regarding private insurance companies. These insurance companies are loaded into the University Physicians billing system and bills are generated for telemedicine consultations in the same manner they are generated for in- person encounters.

In addition to securing private insurance reimbursement, the MTN staff has met with representatives of the Medicaid program on two occasions. They are hopeful that talks with Medicaid will continue and that reimbursement from this agency will occur before the end of 1997.

All telemedicine programs, with the exception of those in the HCFA telemedicine evaluation program, are faced with the continued lack of reimbursement for Medicare consultations. However, there are several proposed acts at the Federal level which attempt to remedy this problem. The MTN staff is hopeful that Congress will pass legislation that will require Medicare to begin reimbursing for telemedicine consultations as soon as possible.

G. Coordination of Telemedicine Efforts

At this point the MTN staff is not aware of any other interactive telemedicine programs operating to any significant extent in Missouri. The Rural Utilities Service did award Boone Hospital Center in Columbia a grant to provide such services but the Boone Hospital staff has not contacted the MUHSC to discuss a cooperative arrangement.

The MTN staff has been working with the Harry S. Truman Veterans Administration Hospital in Columbia and plans are being finalized to connect the VA to the MTN. In return for the link, the Truman VA will participate in the MTN evaluation efforts.

II. Transmission Charges

A. Bandwidth Purchased and Used for Telemedicine Transmission at Each Site

The MTN operates on dedicated T1 lines to each site. Each T1 is fractioned in half with 768k being used for video and 768k used for a data network. The data network is used for sending DICOM compliant teleradiology images and will eventually link the sites to medical libraries at the MUHSC, Internet, e-mail, and the WWW.

MTN SITES AND T1 COST DATA				
Site	**Miles to MU**	**Miles To Network Bridge**	**LATA Type**	**Installation Cost**
Callaway Physicians, Fulton	30	30	Inter	$ 3,071
Callaway Community Hospital, Fulton	30	30	Inter	$ 3,071
Cooper Cty. Mem. Hosp., Boonville*	25	101	Intra	$ 1,270
Pershing Mem. Hospital, Brookfield*	95	52	Intra	$ 1,270
Samaritan Mem. Hospital, Macon*	60	33	Intra	$ 1,567
University Physicians, Boonville*	25	101	Intra	$ 1,270
Fayette Medical Clinic, Fayette*	40	90	Intra	$ 1,270
Keytesville Med. Clinic, Keytesville*	60	83	Intra	$ 1,567
Kirksville Osteopathic Med. Ctr., K'ville*	90	90	Inter	$ 3,071
Kirksville College of Osteopathic Med.*	90	90	Inter	$ 3,071
Missouri Rehab. Center, Mt. Vernon	200	200	Inter	$ 2,382
Moberly Regional Med. Ctr., Moberly	40	55	Intra	$ 3,146
Putnam County Mem. Hosp., Unionville*	136	46	Intra	$ 1,567
Sullivan County Mem. Hosp., Milan*	123	33	Intra	$ 944

Scotland County Mem. Hosp., Memphis*	134	44	Intra	$ 1,567
TOTALS:				$30,104
AVERAGES	79	72		$ 2,007

In the above network there are two MCUs (bridges). One MCU is in Kirksville and the other is in Columbia. The mileage displayed under "Miles to Network Bridge" for the Kirksville sites represents the miles between the Kirksville MCU and the Columbia MCU. The sites marked with an asterisk in the above table are connected to the Kirksville MCU. All other sites connect through the Columbia bridge.

B. Payments Made for T1 Lines

With the exception of two lines (Columbia - Kirksville and Columbia - Mt. Vernon) all installations and line charges are being provided by the respective local exchange carrier and AT&T at no charge through May, 1998. The MUHSC is paying for the lines shown in the table above under "University of Missouri Contributions".

C. Dedicated vs. Switched Network

The MTN uses dedicated T1 lines throughout the network.

D. Per Month Line Charges

The University of Missouri pays $2,048 per month for one T1 line between Columbia and Kirksville, and $3,251 between Columbia and Mt. Vernon.

E. LATA Sensitivity

The T1 rates in Missouri are LATA sensitive. Attachment J provides a map of how the T1 lines are hubbed at Kirksville and Columbia. As the map illustrates, most T1 connections are hubbed at Kirksville before being bridged to Columbia. By hubbing those sites at Kirksville the network saves about $106,000 per year in T1 line charges.

F. LATA Crossings

The only direct hub-spoke crossing of LATAs occurs between the Fulton sites (Callaway Community Hospital and Callaway Physicians), Mt. Vernon and the MUHSC in Columbia. The only other LATA crossings are two T1 connections between the main hub in Columbia (MUHSC) and the secondary hub in Kirksville (KCOM). In short, with 22 VTEL units operating within the network, the network only crosses a LATA on five occasions.

G. Negotiating Lower Phone Rates

To date the MUHSC has not had to negotiate for lower phone rates because 13 of the MTN's 15 T1 lines are being donated by the local exchange carriers (LECs) and AT&T through May, 1998. The MUHSC has been discussing plans with the PSC for a special telemedicine tariff.

Additionally, the Federal Telecommunications Act of 1996 will have a positive impact on the cost of the T1 network after May of 1998. The new Act may eliminate the need for a LEC to back-haul services to an interexchange carrier's (IXC) point of presence before handing the signal off to the remote LEC. This should significantly reduce charges by eliminating the distance between the LEC and the IXC (the point at which the rates are distance sensitive).

Additionally, the MUHSC is working with the Public Service Commission to determine what the discounted rate for T1 service will be to each MTN site under the new Universal Services rules recently released by the FCC.

III. Evaluation and Conclusion

A. Successes

The biggest clinical success has been the installation of teleradiology equipment at six sites. Attachment K is an article about the new sites. Since October 1, 1995, a total of 2,874 cases have been sent across the network. A case typically averages a little over 2 films per case, meaning that over 6,000 films have been read in this time period. Although teleradiology is not an interactive service, it still has served a very important role in providing a much needed service to these areas where very little radiology service exists.

Another big success is that clinical consultations are on the rise and we expect the numbers to increase as the MTN staff continues to work with almost every physician in the network and the specialists at the MUHSC. Interactive consultations in the first three months of this calendar year have already exceeded the total of all consultations conducted in 1996.

The MTN has established set clinics in Dermatology, Psychiatry, Neurology and Pulmonary Medicine. The MTN Staff is now working on set clinics for Cardiology.

The successful technical implementation of the MTN was a catalyst in obtaining additional funding to expand the data network component of the overall network. In October, 1996 the MUHSC was awarded a $4.1 million contract with the National Library of Medicine to provide data networks and related telemedicine services to virtually the entire local health care systems of 3 MTN communities - Boonville, Brookfield and Macon. Local hospitals, clinics, private physician's offices, nursing homes, home health agencies, and similar health care sites will be included in a wide area network, which will use MTN's T1 network for connections to MUHSC and the National Information Infrastructure. Computers and related infrastructure will be provided by the project to most participating work sites. The project will develop and deploy World Wide Web based resources intended to help reduce the isolation of rural providers, and to more effectively meet their information needs. These Web-based resources, along with E-mail, will be made available to providers at all MTN sites in the coming year.

Expansion of the MTN continues with new sites being added to the network since June 1996. Moberly Regional Hospital in Moberly, Missouri became a network member in November 1996. This site was added with monies from HRSA, Southwestern Bell, and Moberly Regional. The MUHSC added two sites in the new University Physicians Medical Building (UPMB). The UPMB houses almost all of the MUHSC's specialty clinics and having two units available in the clinic will make consultations easier to conduct.

Although not funded by HRSA, the MTN provides educational programs to the rural sites five days a week with "Grand Rounds" and customized CME programs. Oncologists from the MUHSC's Ellis Fischel Cancer Center in Columbia recently broadcast a series of Oncology programs to the Kirksville College of Osteopathic Medicine. Attendance at several of those programs exceeded 100 participants. Many of the educational programs broadcast over the network have an indirect impact on clinical practices in rural Missouri. In short, physicians have more time to spend in patient care activities because they no longer have to travel to receive CME programs.

The fact that the University Physicians staff and MTN staff have worked together to incorporate telemedicine into daily business has been a true success. When we complete our scheduling, billing, and medical records systems testing by July, 1997, scheduling, arriving, treating, billing and delivery of medical records will be the same for telemedicine consultations as they are for in-person encounters.

An Interesting Telemedicine Case:
On August 16, 1996 a seven week old male presented in the Sullivan County Memorial Hospital ER with a heart rate of approximately 260 beats per minute. Dr. Warren Williams was handling the case in Milan and called the MUHSC for help. Dr. Sara Sotiropoulos, an MUHSC Child Health specialist, and Dr. Guy Carter, a Pediatric Cardiologist, handled the call in Columbia. During this call a request to connect the two sites via the telemedicine systems was made. From that point forward the telemedicine systems were used handle the case.

The initial minutes of the interactive consultation gave the MUHSC physicians a chance to see what the baby looked like and how he was acting. This initial look at the baby changed the treatment approach the Columbia physicians were going to take based on the phone conversation. In short, the two MUHSC physicians upon getting a look at the baby opted not to cardiovert him immediately. During this case, the baby's vital signs were being monitored, the MUHSC physicians were able to watch the EKG monitor, lab values were obtained and displayed via the document camera, and the University Hospital Flight Team received instructions on the ground from Drs. Sotiropoulos and Carter before departing for Milan.

About 45 minutes into the encounter the flight team arrived in Milan and continued to receive instructions from the same physicians who they were talking with in Columbia 45

minutes earlier. As such, continuity of information was maintained. On several occasions the flight team attempted to package the baby for transport back to Columbia but the baby's disposition seemed to change periodically from active, screaming, and kicking to quiet and lethargic. Based on what the MUHSC physicians were seeing, they decided to start an IV before the baby was put into the helicopter. When the IV was started the baby's disposition changed again and at that point the MUHSC physicians felt he needed to be cardioverted. Dr. Guy Carter began calculating the correct dosages of various medications to have on standby should something go wrong with the cardioversion of the baby. The level of "shock" to deliver to the baby was also defined by Drs. Carter and Sotiropoulos. Dr. Williams proceeded with the cardioversion and the baby's heart rate returned to a normal rhythm. The flight team then packaged the baby and returned safely to Columbia.

In addition to Drs. Sotiropoulos and Carter, the consultation room had numerous medical residents and students observing the process. Each one of these individuals was extremely impressed with what the systems had to offer in terms of conducting a consultation.

As of this writing, the baby is back in his hometown of Milan. He has required subsequent cardioversions for his condition and, in all likelihood, the child will require an electro-physiology procedure to permanently correct his problem. He cannot receive that procedure until he reaches a certain size. Attachment L contains two articles about the Milan baby.

B. Problems

The only real problem the MTN Staff has had since June 1996 has been with VTEL, the manufacturer of the video conferencing units used in the MTN. VTEL has moved from their DOS platform to a Windows 95 based platform, meaning that those who remained on the DOS platform would have little chance of taking advantage of any future enhancements to their systems. The MTN staff believes that the new platform was not quite ready for telemedicine prime time when it was made available. The staff identified many problems with the system and even with repeated efforts to explain these problems to VTEL almost every call went unanswered. Even the MTN reseller of the equipment does not seem to have the ability to get VTEL's attention.

MTN converted to the Windows 95 platform in the late summer of 1996 to avoid system obsolescence. As a result, we had to install the software on approximately 18 machines and then follow up with training on the new systems. This took a fair amount of staff time from other network activities, as could be expected. Although we had problems with the new platform, the staff does feel that moving to the new operating system will be beneficial in the long run.

The MTN staff continues to attempt to connect the MTN into the world of Correctional Telemedicine. In Missouri, correctional healthcare services are provided by Correctional Medical Services (CMS), a for-profit organization. CMS basically provides circuit riders to the prison units within Missouri. Repeated calls to CMS have gone unanswered.

C. Sustainability

Discussions about sustainability of the MTN are moving along as we near the end of the HRSA. RTGP and private funding of the network by the telephone companies expire soon. A list of efforts to keep the MTN moving forward is provided below.

1. The Missouri Public Service Commission (PSC) members of the PSC Telemedicine Sustainability Taskforce (TST) are calculating the discounts that the network can expect under the new Universal Service fund. Those discounts are based on the same discounts offered to schools and libraries under the same fund.

2. The members of the TST agree that the LATA structure will not go away until the time competition is truly in place in all areas. As such, the network needs to take the LATA structure into consideration when ordering services.

3. In the near future, the MTN staff will begin to assess what each site thinks the MTN is worth to their facility. This will help the MTN staff determine a reasonable recurring network fee that could be contributed to the continued operations of the network.

4. The TST discussed the possibility that IATV services could be provided by Frame Relay technologies. Frame relay services are very attractive in terms of their pricing. However, the TST agrees that while efforts are underway to explore the use of frame relay services with interactive video, it will be some time before a good quality IATV system will work using the service.

5. AT&T is currently researching the costs associated with connecting all MTN sites to Columbia as opposed to having a second telecommunications hub in Kirksville. The discounts compiled by the PSC will be applied to these charges. This effort is being done at the request of the MTN which currently maintains the equipment at two hub sites. The MTN staff feel that if financially feasible, maintaining one hub is far less expensive than maintaining two.

6. The PSC Telemedicine Committee and TST will provide information to the FCC as they evaluate the Federal Universal Service Fund and how it relates to telemedicine over the next few years.

7. The PSC Telemedicine Committee and TST will continue to meet on at least a quarterly basis to work on sustainability issues.

8. SWB will be investigating the possibility of moving the hardware located in the MTN Kirksville hub to the SWB Central Office in Kirksville. This will make

maintenance of the systems easier and place the equipment in a more controlled telecommunications environment.

9. The MTN will continue to work with Medicaid, HCFA and private insurance companies until telemedicine consultations are reimbursed by all third parties on a regular basis.

10. The MTN staff will continue to look for alternative telemedicine solutions in an effort to lower the cost of operating the network and delivering services.

11. MTN will begin to design fee schedules for certain educational programs and for outside groups wishing to use the network.

12. The MTN Staff will continue exploring Federal, State and private funding sources to help offset the costs associated with operating the MTN.